

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 69.28**WELDING INSPECTION REPORT****Resident Engineer:** Pursell, Gary**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-004097**Date Inspected:** 09-Oct-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 2300**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 730**Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **Location:** Shanghai, China**CWI Name:** Sun Bo, Jiang Jian Fei**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** OBG, Tower**Summary of Items Observed:**

Caltrans Quality Assurance (QA) Inspector, Ken Jobes, arrived on site at the Zhenhua Port Machinery Company (ZPMC) facility at Changxing Island, in Shanghai, China, to randomly monitor welding and Quality Control (QC) functions. While on site, the QA Inspector observed and/or discovered the following:

**New Tower Bay 1**

The Caltrans QA Inspector randomly observed the Submerged Arc Welding (SAW) of fill passes on Weld Nos. SSD1-SA171C/D-26A, 23, 20A, 3 by welding operator, Lu Hai Xian (I. D. No. 040252); Weld Nos. SSD1-SA208A/D-10A, 8, 7A and SSD1-SA208B/D-3 by welding operator, Xu Xiu Shui (I. D. No. 040489); and Weld Nos. SSD1-SA171C/D-10, 19A, 21, 25A by welding operator, Xu Yan (I. D. No. 052917). All of the above welds were being welded in the flat groove (1G) welding position. For each welder, all of the weld numbers were on the same weld joint. They alternate partial joint penetration (PJP) and complete joint penetration (CJP) along the joint. The "A" welds are CJP and the welds without a letter designation are PJP.

The two Welding Procedure Specification (WPS) Nos. were WPS-B-T-2221-B-U3c-S-2 for the CJP and WPS-B-T-2321-P3-S-2 for the PJP. Certified Welding Inspector (CWI), Jiang Jian Fei (CWI No. 07120691) was present during this welding as was ABF Inspector, Zhang Zi Wen. The QA Inspector verified the qualifications of the welding operators.

**New Tower Bay 2**

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The Caltrans QA Inspector randomly observed the Submerged Arc Welding (SAW) of fill passes on Weld Nos. ESD1-SA384B/D-4B; and ESD1-SA384A/D-42B, 39B, 41, 36B, 38 in the flat groove (1G) welding position. All of the welds are on the same joint and are numbered as such because they alternate partial joint penetration (PJP) and complete joint penetration (CJP) along the joint. The “B” welds are CJP and the welds without a letter designation are PJP. The welding operator was Cao Gui Mei (I. D. No. 047304). The two Welding Procedure Specification (WPS) Nos. were WPS-B-T-2221-B-U3c-S-2 for the CJP and WPS-B-T-2321-P3-S-2 for the PJP. Certified Welding Inspector (CWI), An Qing Xiang (CWI No. 07120651) was present during this welding as was ABF Inspector, Zhang Da Ming. The QA Inspector verified the qualifications of the welding operator, and that the electrode/flux classification, diameter of electrode, amperage, voltage, travel speed, and preheat/interpass temperatures were as specified on the WPS.

The Caltrans QA Inspector also randomly observed the preheating of Weld Nos. ESD1-SA376B/E-9B, 5B, 8B, 7 and ESD1-SA376C/E-28, 30. The root pass had not yet been welded. All of the welds are on the same joint and are numbered as such because they alternate partial joint penetration (PJP) and complete joint penetration (CJP) along the joint. The “B” welds are CJP and the welds without a letter designation are PJP. The welding operator standing by was Yang Mei Zhen (I. D. No. 042195), whose qualifications for SAW in the 1G welding position were verified.

### OBG Sub-Assembly Shop – Bay 1

The Caltrans QA Inspector randomly observed the Submerged Arc Welding (SAW) of the second pass (cover pass) on Weld Nos. DP384-001-3, 4, 7 and 8. The Gantry No. 2 operator was Feng Chang Hong and the welding operators in ascending order were Xu Guo Yin (I. D. 059443), Chen Jie (I. D. 059468), Xiang Huang Feng (I. D. 059416), and Jiang Jie (I. D. 059378). The Welding Procedure Specification (WPS) used was WPS-B-T-2342-U1(Urib)-4. It is a combination procedure using gas metal arc welding (GMAW) for the root pass and submerged arc welding (SAW) for the cover or fill pass. Certified Welding Inspector (CWI), Sun Bo (08021741) and ABF QA Inspector Chang Bao Qian were present during welding.

Caltrans Quality Assurance (QA) Inspector, Ken Jobes, was present to monitor activities associated with the Production Monitoring Test (PMT) of Orthotropic Box Girder (OBG) Deck Panel U-rib welds. The PMT representing Deck Panel DP536-001 was monitored. After MT of the tack welds was accepted by ZPMC Level II MT Technician, Cai Xin Xin, the three ribs (six welds) were simultaneously welded to simulated deck plates in the horizontal groove (2G) welding position. The Welding Procedure Specification (WPS) used was WPS-B-T-2342-U1(Urib)-4. It is a combination procedure using gas metal arc welding (GMAW) for the root pass and submerged arc welding (SAW) for the cover or fill pass. The filler metals being used were verified to be as specified on the WPS; 1.4 mm diameter, ER70S-6 (JM-56) for GMAW and 4.8 mm diameter EH14K (H14) for SAW. During the test, the Caltrans QA Inspector recorded the parameters of amperage, voltage, and travel speed on the U-Ribs PMT Inspection Sheet, dated 10-10-08, for both welding processes. The name of the gantry operators and each of the welding operators' identification numbers were also recorded on the U-Ribs PMT Inspection Sheet. ZPMC Certified Welding Inspector (CWI), Sun Bo (08021741) and ABF QA Inspector Chang Bao Qian were present during welding.

The final weld was visually examined and accepted by ZPMC CWI, Sun Bo; and ABF QA Inspector Chang Bao Qian. All welds appeared to meet the specified visual examination acceptance criteria. After ultrasonic

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## WELDING INSPECTION REPORT

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examination (UT) and acceptance by ZPMC Level II UT Technician, Xu Wei, the Caltrans QA Inspector designated the locations for the required macro-etch specimens. All macro-etch specimens were prepared and found acceptable by ZPMC CWI, and ABF QA Inspector. The macro-etch specimens were then examined by the Caltrans QA Inspector and the depth of penetration on each measured and the results recorded on Caltrans Project 04-0120F4 SAS OBG Fabrication Macro Etch Log.

All above observations appeared to meet the requirements of the job specifications.

### Summary of Conversations:

As identified within the contents of this report.

### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Ady Velasco (13816942685) China, who represents the Office of Structural Materials for your project.

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<b>Inspected By:</b>	Jobes, Kenneth	Quality Assurance Inspector
<b>Reviewed By:</b>	Carreon, Albert	QA Reviewer

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